Meeting on July 16th 2002

Minutes taker Ina Reichel

Those present J. Corlett, I. Reichel, S. de Santis, W. Wan, A. Wolski

Absent(excused) A. Zholents

Date July 19th 2002

Distribution

J. Corlett
I. Reichel
D. Robin
S. de Santis
W. Wan
A. Wolski
A. Zholents

Overview of topics

1 Tracking results from MERLIN (A. Wolski)

The tracking was done with a completely flat bunch and includes the full RF focusing which is not in the theoretical model. The RF focusing is expected to reduce the bunch shape distortion, so this is consistent with the results. The comparison indicates that the tracking code with the wake fields is working correctly. Figure 14 shows tracking results (dots) and analytical calculations (line).

As Andy sees strong effects from the fringe fields of the cavities there was a lengthy discussion if this effect is also included in MAD.

The next step is to confirm the lattice, and study the effects of misalignments in the main linac on the final bunch shape.

2 Update on a design of the first bunch compressor (I. Reichel)

Ina got a detailed drawing from Russ Wells to show the available space. The horizontal offset of the beamline has to be 3.19 m or less.

She has tried some more lattices in order to achieve the required R_{56} but they all fail for one or more of the following reasons:

- large dispersion prime at the end of the beamline

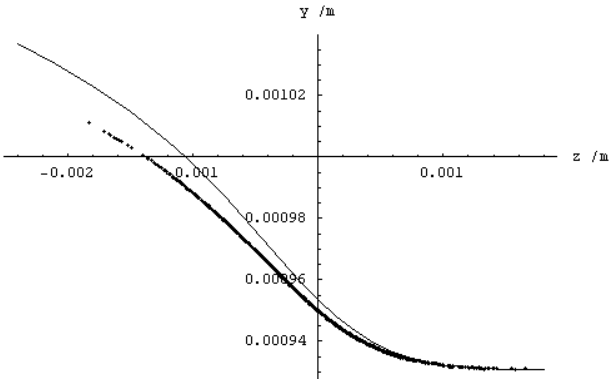

Figure 14: Comparison between tracking results from MERLIN (dots) and analytical calculations (line).

- too small R_{56}
- need much more space than is available

Ina has found a solution using a dedicted compressor. The compressor itself is approximately 6 m long and uses four 60 cm long bending magnets which have a bending angle of 0.4 rad. The horizontal offset of the beamline is done using two double bend achromats (one for each direction). The solution needs a bit more fine-tuning as not all boundary conditions are matched exactly (they are close enough so that it should not be too difficult). The offset in the compressor is about 1 m. The lattice is shown in Fig. 15.

As this solution does not allow to adjust R_{56} much, Weishi suggested looking into using big 45° bending magnets and a very wide beam pipe. Ina will look at that to see what dimensions are necessary.

As soon as a final lattice is available Ina will study effects of coherent synchrotron radiation using ELEGANT and TRAFFIC4.

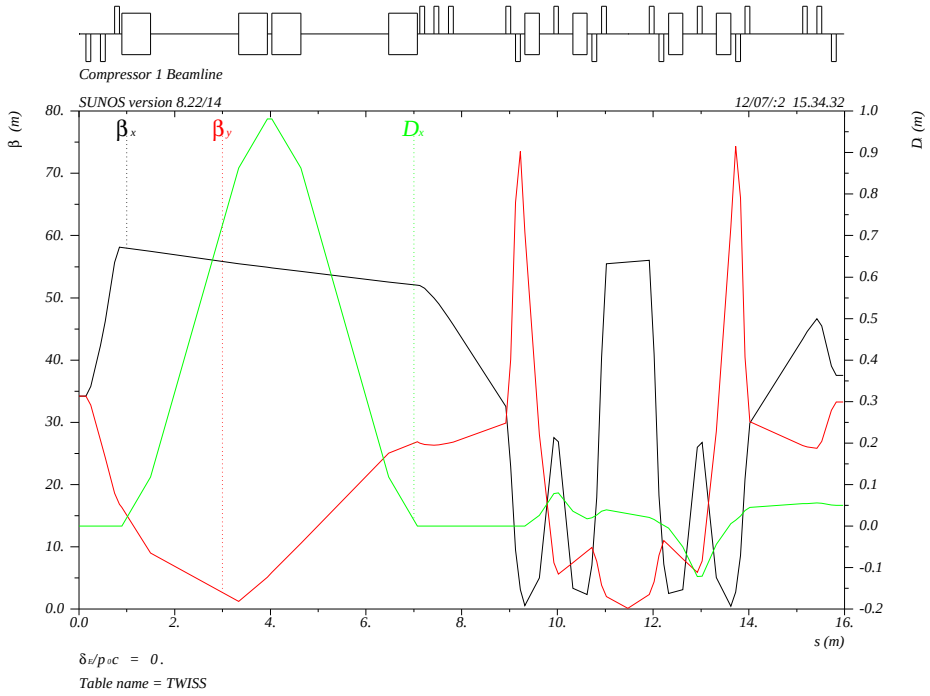

Figure 15: Preliminary lattice for the first compressor using a dedicated compressor and two double bend achromats.